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Standing tall after DeBakey Type I aortic dissection extending to left iliac artery

Deepak Natarajan *, *Nalin Natarajan*

Park Hospitals, Delhi NCR, India

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ABSTRACT

This report describes DeBakey Type I aortic dissection in a middle-aged hypertensive female who had undergone mitral tissue valve replacement a decade previously. The patient had severe abrupt onset tearing pain in her throat, back, and chest, for which she got admitted in a community hospital, where because of no changes in her ECG and biomarkers, the dissection of aorta was missed. She was subjected to coronary angiography more than 6 weeks later for pain in her left shoulder, which demonstrated normal vessels. She then underwent multi-detector computerised tomography aortogram (MD CTA) that revealed aortic dissection involving ascending, the arch, and descending thoracic and abdominal aorta. The patient declined surgical intervention and has been provided medical therapy in the form of high dose oral beta-blocker and losartan. The patient continues to be stable for the past 18 weeks since the index event. The report highlights the importance of detecting aortic dissection by keeping high index of clinical suspicion in a patient with abrupt onset tearing pain in the throat/back and employment of MD CTA.

A 49-year-old woman suffering from hypertension for the past 5 years, and who had undergone mitral valve replacement with a bio-prosthetic valve a decade ago for rheumatic mitral regurgitation, was admitted for sudden onset severe tearing pain in her throat, followed by pain in the inter-scapular region, and then heaviness over the chest in an outside hospital 6 weeks ago. She was managed then with analgesics as the ECG displayed no changes and her cardiac biomarkers were normal. Invasive coronary angiography done during the current admission for intermittent pain in her left shoulder demonstrated normal coronary arteries (Figs. 1 and 2). She underwent a multi-detector 256 slice computed tomography contrast aortography (CTA) that revealed extensive aortic dissection involving the ascending aorta (Fig. 3A and B, red arrow), the arch (Fig. 3A and C, red arrow), and descending aorta up to her left iliac artery (Fig. 3A and B, red arrow, and Fig. 3D, blue arrow); cross-sectional CTA showed dissection of her ascending (Fig. 3D, red arrow) and descending aorta (Fig. 3D blue arrow). The aortic root and ascending aorta were dilated measuring 4.6 × 5.7 cm in AP dimensions. There was no sign of an intramural hematoma.

Transthoracic echocardiography demonstrated the dissection flap in both parasternal and short axis views (Fig. 4A and B, video 2).

* *Corresponding author.*
E-mail address: deepaknatarajan@me.com (D. Natarajan).

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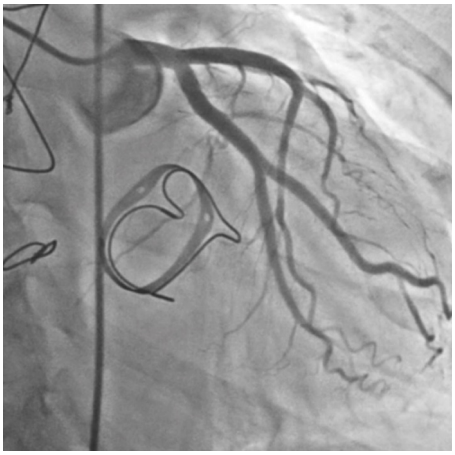

Fig. 1 – Coronary angiogram demonstrating normal left coronary artery; the bioprosthetic mitral valve is also seen.

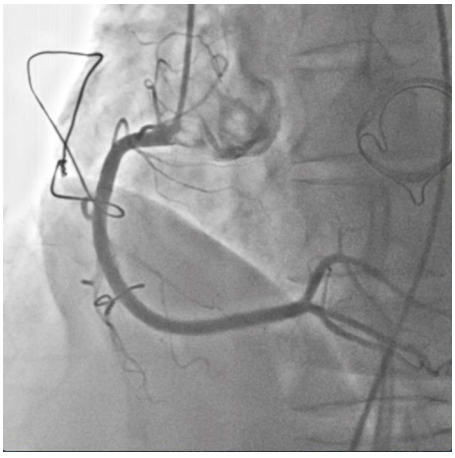

Fig. 2 – Coronary angiogram demonstrating normal right coronary artery.

The patient classified as having chronic DeBakey Type I aortic dissection[1,2] declined surgical intervention. She has been put on tablet metoprolol 100 mg twice a day to keep blood pressure under control (reducing shear stress) and tablet losartan 50 mg to block transforming growth beta (TGF-B) activity.[3,4]

The role of surgical management in chronic DeBakey Type I aortic dissection, in patients who have already undergone open-heart surgery, those over 80 years, and in patients with neurological complications remains to be established.

Mortality in untreated DeBakey Type I aortic dissection exceeds 70% at 1 week as it ranges at 1%/h; almost 50% are dead by 48 h and therefore, emergency aortic repair continues to be standard therapy for acute type I dissection. Death rates are lower albeit substantial in type III distal aortic dissection extending from the left subclavian artery, with minimum mortality of 10% at 30 days.[5,6]

The first reported case of acute aortic dissection was that of late King George II of England who died in 1760 of pericardial tamponade because of acute ascending aortic dissection, which was confirmed by his personal physician whose task was to open and embalm the royal corpse, but the phrase ''dissecting aneurysm'' got to be coined much later in 1819 by Rene Laennec, the inventor of the stethoscope. DeBakey, Cooley, and Creech performed the first successful surgical repair of aortic dissection in 1954.[7] In-hospital mortality of surgically managed patients was 27% in the International Registry of Acute Aortic Dissection (IRAD) database as opposed to 56% managed medically. Interestingly, 1-year survival in the surgically treated cohort was 96% versus 89% in the medical group. At the end of 3 years, 69% of medically treated patients survived compared to 89% after surgery.[8,9]

The optimal management of patients presenting late after symptom onset remains to be defined. A prospective single institution study involving 195 patients with type A dissection that compared immediate surgical repair with wait and watch surgery policy reported similar long-term survival, but the immediate surgery cohort showed a trend toward 30-day mortality (16.5% versus 8.7%, $p = 0.1031$). Of the 92 patients in the wait and watch policy, 53 (57.6%) did eventually undergo operative repair 8.2 days after onset of symptoms. More than 40% of patients of type A aortic dissection managed medically survived 42.8 months of follow-up. The data suggest that dissections stabilize if the patient survives the initial catastrophe; medical management in such patients with advanced age or significant comorbid conditions may result in acceptable outcomes than previously considered. The sickest patients usually succumb before hospital admission. It may be underscored that non-operative treatment for late presenting cases is proscribed, and whenever felt essential for obviating mortality or better clinical outcomes, surgical repair is the treatment of choice.[6]

Delays in diagnosis of acute aortic dissection, as per IRAD, do not uncommonly occur in female patients, atypical symptoms not including abrupt pain located in chest or back, and absence of pulse deficit or hypotension, and in patients presenting to non-tertiary hospitals.[9]

The European Society of Cardiology recommends multi-detector computed tomography angiography as the first line of investigation in patients suspected to be suffering from aortic dissection. Multi-detector computed tomography angiography carries a sensitivity of 100%, specificity of 98% and diagnostic odds ratio of 6.5. Transthoracic echocardiography in patients with shock has been shown to have a sensitivity of 78.3% and 83% specificity for diagnosing proximal aortic dissection; echocardiography can, however, not be suitably employed to confirm dissection of the descending aorta in most patients.[1] Trans-esophageal echocardiography (TEE), on the other hand, can visualize the entire aorta with sensitivity and specificity of 98% and 95%, respectively; TEE has the advantage of being performed at the bedside.[1] The IRAD database reported the first modality of choice for imaging as computed tomography in 63%, TEE in 32%, invasive aortography in 4%, and MRI in only 1%.[8]

This middle-aged hypertensive woman, who suffered dissection of almost her entire aorta but could not be

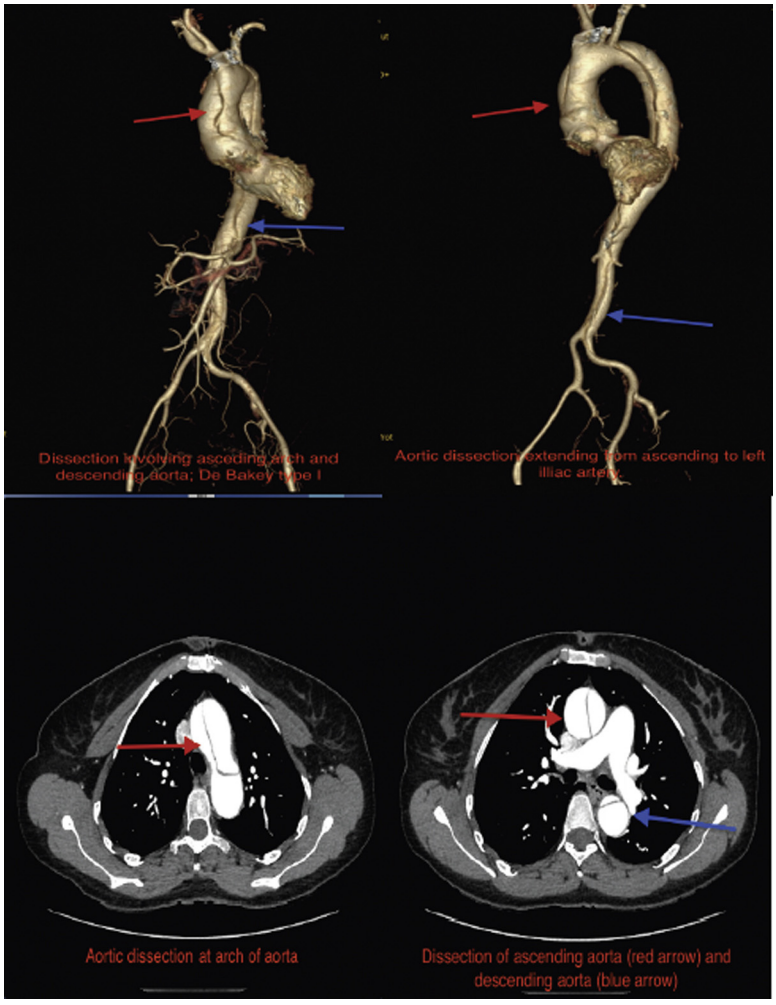

Fig. 3 – (A) Multi-detector 256 slice computed tomography 3D re-constructed contrast aortogram image showing dissection of ascending aorta (red arrow) and descending aorta (blue arrow). (B) Multi-detector 256 slice computed tomography 3D re-constructed contrast aortogram showing dissection of the ascending aorta (red arrow) and descending abdominal aorta up to left iliac artery. (C) Multi-detector computed tomography contrast cross-sectional scan showing dissection involving the arch of the aorta (red arrow). (D) Multi-detector computed tomography contrast cross-sectional scan demonstrating dissection of ascending aorta (red arrow) and the descending aorta (blue arrow) at the level of the pulmonary artery bifurcation.

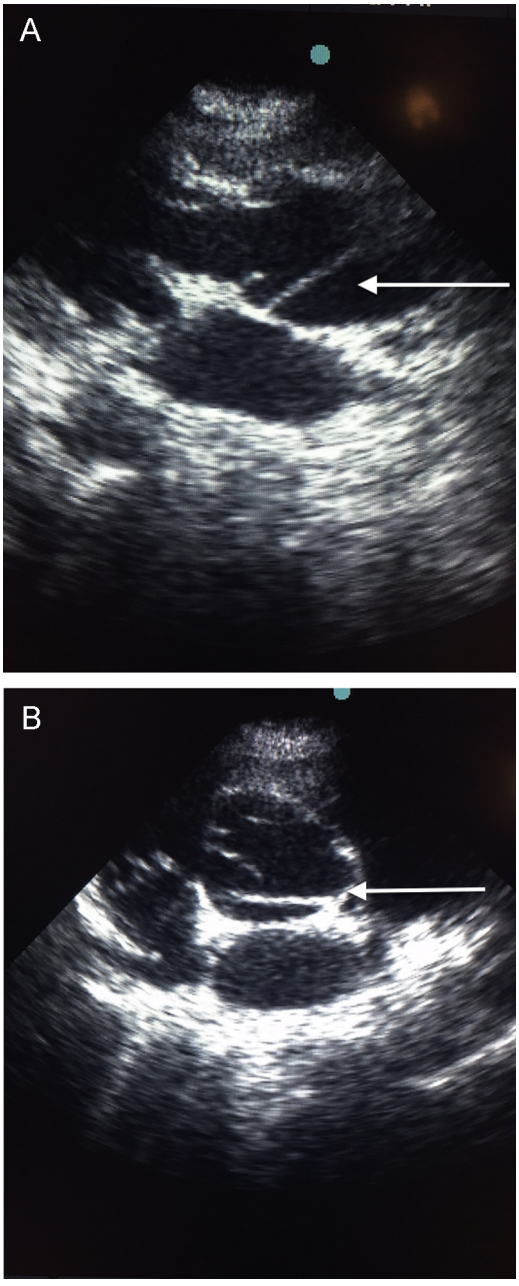

Fig. 4 – (A) Transthoracic 2D echocardiogram in parasternal long axis view showing aortic dissection flap (white arrow) just above the level of the aortic valve. (B) Transthoracic 2D echocardiogram in short axis view demonstrating dissection flap separating the true and false lumen almost at the aortic valve leaflets level (white arrow).

diagnosed in a non-tertiary hospital, has now survived for more than 4 months on tight medical treatment. The dissection was confirmed by multi-detector computed tomography angiography and transthoracic echocardiography. This report does not advocate non-surgical treatment; however, patients who refuse surgery or are poor surgical candidates may be managed conservatively with continued aortic surveillance.

Conflicts of interest

The authors have none to declare.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.ihj.2015.06.026.

REFERENCES

1. Thurumurthy G, Karthikesalingam A, Patterson OB, et al. The diagnosis and management of aortic dissection. *BMJ*. 2012;344:d8290.
2. Baliga RR, Nienaber CA, Bossone E, et al. The role of imaging in aortic dissection and related syndromes. *J Am Coll Cardiol Img*. 2014;7:406–424.
3. Lacro RV, Dietz HC, Sleeper AT, et al. Atenolol versus losartan in children and young adults with Marfan's Syndrome. *N Engl J Med*. 2014;371:2061–2071.
4. Kaene MG, Pyeritz RE. Medical Management of Marfan Syndrome. *Circulation*. 2008;117:2802–2813.
5. Goldfinger JZ, Halperin JL, Marin M, et al. Thoracic aortic aneurysm and dissection. *J Am Coll Cardiol*. 2014;64:1725–1739.
6. Davies RR, Coe MP, Mandapati D, et al. What is the optimal management of late presenting survivors of acute type A aortic dissection. *Ann Thorac Surg*. 2007;83:1593–1602.
7. Craido F. Aortic dissection: a 250-year perspective. *Tex Heart Inst J*. 2011;38:694–700.
8. Tsai TT, Trimarchi S, Nienaber CA. Acute aortic dissection: perspectives from the International Registry of Acute Aortic Dissection (IRAD). *Eur J Vasc Endovasc Surg*. 2009;37:149–159.
9. Tsai TT, Evangelista A, Nienabar CA, et al. International Registry of Acute Aortic Dissection (IRAD). Long term survival in patients presenting with type A acute dissection: insights from the International Registry of Acute Aortic Dissection (IRAD). *Circulation*. 2006;114:1350–1356.